

NANOELECTRODES AND NANOTIPS FOR RECORDING TRANSMEMBRANE CURRENTS IN A PLURALITY OF CELLS

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Abstract

The present invention relates to methods of measuring electrical properties of a cell using electrode devices comprising tapered nanotips having submicrometer dimensions (“nanoelectrodes”) for insertion into a cell. The devices are used to measure electrical properties of the cell and, optionally, may be used to electroporate, the cell or
10 subcellular structures within the cell. The invention also provides arrays of electrode devices having nanotips for simultaneously or sequentially measuring the electrical properties of cells (e.g., such as surface immobilized cells). The electrodes can be used to measure properties of ion channels and in HTS assays to identify drugs which affect the properties of ion channels. The invention additionally provides microfluidic systems
15 adapted for use with the electrode devices having nanotips. In combination with the electrodes, the microfluidic systems provide cell-based biosensors for monitoring cellular responses to conditions, such as exposure to candidate drugs.